CLAIMS

1. A method of monitoring the formation of a coating on a single particle (P), comprising the steps of: arranging the particle (P) at a given spatial location; forming said coating on the particle (P); and obtaining a measurement value of at least one principal parameter related to said coating, c h a r a c t e r i z e d in that said measurement value is obtained by performing a spectrometric measurement on said coating during said step of forming said coating.

2. A method as set forth in claim 1, wherein said spectrometric measurement is performed continuously during at least part of the step of forming said coating, thereby generating a sequence of measurement values of said at least one principal parameter.

3. A method as set forth in claim 1 or 2, wherein said step of arranging the particle (P) at a given spatial location includes fluidizing said particle (P) on an upwardly directed gas flow.

4. A method as set forth in any one of claims 1-3, wherein said step of forming said coating on the particle (P) includes generating a single droplet (D) of a fluid, and bringing said droplet to impinge on said particle (P).

5. A method as set forth in claims 3 and 4, wherein said droplet (D) upon said generation is moved into and allowed to follow said upwardly directed gas flow to said particle (P).

6. A method as set forth in claim 4 or 5, wherein said single droplet (D) is repeatedly generated, thereby forming at least one stream of such droplets (D) that sequentially impinge on said particle (P).

7. A method as set forth in any one of the preceding claims, further comprising a step of monitoring at least one control parameter related to the environment of the particle (P) or the particle (P) itself, and a step of identifying a functional relationship between said at least one control parameter and said at least one principal parameter.

8. A method as set forth in claim 7, further comprising a step of generating, based on said functional relationship for said single particle (P), an aggregate model for

prediction of the influence of said at least one control parameter on said at least one principal parameter for a large number of such particles (P).

9. A method as set forth in claim 7 or 8, further comprising the step of changing said at least one control parameter based, at least partly, on said measurement value.

10. A method as set forth in any one of claims 7-9 in combination with claim 3 or 5, wherein said at least one control parameter includes a property of said gas flow, such as a flow rate, a temperature or a content of a solvent.

11. A method as set forth in any one of claims 7-9, wherein said at least one control parameter includes a property of the particle (P), such as a size, a shape, a density or a porosity.

12. A method as set forth in any one of claims 7-9 in combination with any one of claims 4-6, wherein said at least one control parameter includes a property of said droplet (D), such as a droplet size, a droplet generation rate or a concentration of a droplet constituent.

13. A method as set forth in any one of claims 7-9 in combination with any one of claims 4-6, wherein said at least one control parameter includes a duration of a wetting period during said step of forming said coating, said wetting period being effected by controlling said droplet generation.

14. A method as set forth in any one of claims 7-9 in combination with any one of claims 4-6, wherein said at least one control parameter includes a duration of a drying period during said step of forming said coating.

15. A method as set forth in any one of the preceding claims, wherein said step of obtaining said measurement value includes generating a sample vector of measurement data from said spectrometric measurement, and condensing said measurement data into said measurement value of said at least one principal parameter.

16. A method as set forth in any one of the preceding claims, wherein said spectrometric measurement is performed by means of near-infrared spectrometry

17. A method as set forth in any one of the preceding claims, wherein said spectrometric measurement is performed by means of a spectrometric method based on Raman scattering.

18. A method as set forth in any one of the preceding claims, wherein said spectrometric measurement is performed by means of a spectrometric method based on absorption in the UV, visible, or infrared (IR) wavelength region, or luminescence, such as fluorescence emission.

19. A method as set forth in any one of the preceding claims, wherein said spectrometric measurement is performed by means of imaging spectrometry.

20. A method as set forth in any one of the preceding claims, wherein said particle (P) is a pharmaceutical product, such as a pellet a tablet or a capsule.

21. Use of a method as set forth in any one of the preceding claims for identifying a functional relationship between said at least one principal parameter and properties of an environment of the particle (P) during the formation of said coating, and/or properties of the particle (P) itself.

22. Use of a method as set forth in claim 2 for control of a coating process of a batch of particles, wherein said sequence of measurement values is used as a sequence of reference values in said control, and wherein a corresponding spectroscopic measurement is effected on said batch of particles to provide a sequence of actual values for said control.

23. Use of a method as set forth in any one of claims 1-20 for control of a coating process of a batch of particles, wherein a functional relationship is identified between said at least one principal parameter and at least one simultaneously monitored control parameter, which is related to an environment of said single particle (P); wherein one or more of said at least one control parameters, based on said functional relationship, is selected to represent one or more of said at least one principal parameters; wherein a desired sequence of values of said one or more selected control parameters is determined for said single particle (P); and wherein said coating process of a batch of particles is controlled based on said desired sequence of selected control parameter values.

24. An apparatus for monitoring the formation of a coating on a single particle (P), comprising means (2, 5, 6, 9) for arranging said particle (P) at a given spatial location, and a fluid supply unit (3) adapted to apply a coating fluid to said particle (P) such that said coating is formed, c h a r a c t e r i z e d by a measurement unit (4) which is adapted to perform a spectrometric measurement on said coating during formation thereof, and to derive a measurement value of at least one principal parameter related to said coating.

25. An apparatus as set forth in claim 24, wherein said measurement unit (4) is adapted to continuously perform said spectrometric measurement, thereby generating a sequence of measurement values of said at least one principal parameter.

26. An apparatus as set forth in claim 24 or 25, wherein said particle arranging means (2, 5, 6, 9) comprises a flow unit (2) which is adapted to generate a fluidizing gas flow on which the particle (P) is fluidized.

27. An apparatus as set forth in claim 26, further comprising a housing (1) in which said coating is formed on said particle (P), wherein said flow unit (2) is adapted to provide a shielding gas inside the housing (1) intermediate the measurement unit (4) and the location of said particle (P), said shielding gas being essentially identical to the gas used for fluidizing said particle (P).

28. An apparatus as set forth in any one of claims 24-27, wherein said fluid supply unit (3) is operable to generate a single droplet (D) that is brought to impinge on said particle (P).

29. An apparatus as set forth in claim 26 and 28, wherein said fluid supply unit (3) is arranged to inject each droplet (D) into said fluidizing gas flow.

30. An apparatus as set forth in claim 28 or 29, wherein said fluid supply unit (3) is arranged to repeatedly generate said single droplet (D), thereby forming a stream of such droplets (D) that sequentially impinge on said particle (P).

31. An apparatus as set forth in any one of claims 24-30, further comprising a control unit (5) which is adapted to monitor at least one control parameter related to the environment of the particle (P) or the particle (P) itself

32. An apparatus as set forth in claim 31, wherein the control unit (5) is adapted to receive said measurement value from said measurement unit (4) and to effect a change of said at least one control parameter based, at least partly, on said measurement value.

33. An apparatus as set forth in claim 32 in combination with claim 26 or 28, wherein said at least one control parameter includes a property of said fluidizing gas flow, such as a flow rate, a moisture content or a temperature, and wherein said control unit (5) is operable to effect said change by controlling said flow unit (2).

34. An apparatus as set forth in claim 32 in combination with any one of claims 28-30, wherein said at least one control parameter includes a property of said droplets, such as a droplet size, a droplet generation rate or a concentration of a droplet constituent, and wherein said control unit (5) is operable to effect said change by controlling said fluid supply unit (3).

35. An apparatus as set forth in claim 32 in combination with any one of claims 28-30, wherein said at least one control parameter includes a duration of a droplet generation period, and wherein said control unit (5) is operable to effect said change by controlling said fluid supply unit (3).

36. An apparatus as set forth in claim 32 in combination with any one of claims 28-30, wherein said at least one control parameter includes a duration of a drying period, and wherein said control unit is operable to effect said change by controlling said fluid supply unit (3).

37. An apparatus as set forth in any one of claims 24-36, wherein said measurement unit (4) is adapted to perform said spectrometric measurement by means of near-infrared spectrometry.

38. An apparatus as set forth in any one of claims 24-37, wherein said measurement unit (4) is adapted to perform said spectrometric measurement by means of a spectrometric method based on Raman scattering.

39. An apparatus as set forth in any one of claims 24-38, said measurement unit (4) is adapted to perform said spectrometric measurement by means of a spectrometric method

based on absorption in the UV, visible, or infrared (IR) wavelength region, or luminescence, such as fluorescence emission.

40. An apparatus as set forth in any one of claims 24-39, wherein said measurement unit (4) is adapted to perform said spectrometric measurement by means of imaging spectrometry.

41. An apparatus as set forth in any one of claims 24-40, wherein said particle (P) is a pharmaceutical product such as a pellet, a tablet or a capsule.